

[54] RADIALLY EXPANDABLE FIXATION MEMBER

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[56] References Cited

U.S. PATENT DOCUMENTS

3,868,956	3/1975	Alfidi et al. .	
4,553,545	11/1985	Maass et al.	604/104
4,572,186	2/1986	Gould et al.	604/104
4,649,922	3/1987	Wiktor	623/1
4,655,771	4/1987	Wallsten	623/1
4,681,110	7/1987	Wiktor .	
4,699,611	10/1987	Bowden	604/105
4,723,549	2/1988	Wholey et al.	606/194
4,732,152	3/1988	Wallsten et al.	623/1
4,733,665	3/1988	Palmar	623/1
4,793,348	12/1988	Palmar .	
4,800,882	1/1989	Gianturco	623/13
4,830,003	5/1989	Wolff et al.	623/1
4,848,343	7/1989	Wallsten et al.	604/271
4,856,516	8/1989	Hillstead	604/96
4,886,062	12/1989	Wiktor	623/1
4,921,484	5/1990	Hillstead	604/104

OTHER PUBLICATIONS

"Transluminally-Plated Coilspring Endarterial Tube Grafts", Charles T. Dotter, M.D., pp. 329-332, *Investigative Radiology*, Sep.-Oct. 1969, vol. 4.

Technical Developments and Instrumentation, "Transluminally Expandable Nitinol Coil Stent Grafting: Preliminary Report", Dotter et al., pp. 259-260, *Radiology* 147, Apr. 1983.

"Astherosclerotic Rabbit Aortas: Expandable Instrumental Grafting", *Radiology*, 1986 (Sep.), pp. 723-726, Palmaz et al.

Interventional Radiology, "Self-Expanding Metallic Stents for Small Vessels: an Experimental Evaluation", Duprat et al., pp. 469-472, vol. 162, Feb. 1987, *Radiology*.

"Self-Expanding Endovascular Prosthesis: An Experimental Study", *Radiology* 1987, (Sep.), pp. 709-714, Rousseau et al.

"When Hope is all in Vein", *Sweden Now*, Mar. 1988.

"The Temporary Stent Catheter: A Non Operative Treatment for Acute Occlusion During Coronary--Trigiploasty", Gaspard et al., *JACC*, vol. 15, No. 2, Feb. 1990, pp. 1A; 118A.

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[57] ABSTRACT

An open weave fixation device is secured to a distal end region of a catheter or other diagnostic or treatment device, for either temporarily or permanently fixing the device within a body cavity. In one approach, the fixation element is constructed of braided, helically wound filaments of resilient stainless steel. A sheath surrounds the catheter and fixation element to elastically deform the element into a reduced radius configuration to facilitate insertion and deployment. With the fixation element positioned as desired, the sheath is withdrawn to permit the fixation element to self-expand against body tissue, thus to secure the fixation element and catheter. In an alternative arrangement, a dilatation balloon surrounds a catheter near its distal end, and in turn is surrounded by a plastically deformable fixation element. Following desired positioning, the balloon is dilated to permanently deform the fixation element into contact with body tissue. In either case, the fixation element can be mounted at its distal end, its proximal end or medially, depending upon the particular treatment and the expected duration of fixation. Another approach employs a recovery metal in the fixation element.

21 Claims, 2 Drawing Sheets

